

Aquatic beetle species and their distributions in Xinjiang, China

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Abstract: The species of aquatic beetles and their distributions in lotic and lentic habitats were investigated during July to August of 2005 and 2006 in Xinjiang Uygur Autonomous Region, China. A total of 66 species belonging to 7 beetle families (Dytiscidae, Gyrinidae, Haliplidae, Helophoridae, Noteridae, Hydraenidae, Hydrophilidae) are recorded, of which 16 are new records of aquatic beetles for China.

Keywords: aquatic beetles; habitats; lentic; lotic; new record; Xinjiang; China

Introduction

Recent aquatic insect surveys in central Asia enable the production of robust species lists and distribution records for water beetles. Most notably, the Chinese Water Beetle Survey (1993–1998) sponsored by the Naturhistorisches Museum Wien reviews a large portion of the aquatic beetle fauna of China and neighboring regions (e.g., Angus 1995; Gentili 1995; Gentili & Hebauer 1995; Nilsson 1995; Vondel 1995) except for Xinjiang Uygur Autonomous Region. So far it is still not clear about the species and distributions of aquatic beetles in Xinjiang.

Xinjiang is located in the center of the Eurasian Continent northwest of China, between 34°10' and 49°30' N latitude and 73°30' and 96°30' E longitude,

Xinjiang has a variety of aquatic habitats, such as rivers, streams, lakes, reservoirs, ponds, rice paddies and marshes. Most of the rivers are mountainous inland ones, which originate in the mountainous region and then pour into the ravine, inland basin lake or vanish after flowing into desert. They are characterized by steep slope, fast flowing and low temperature in upstream and a great quantity of gravel, sandy and silty substrates in the middle and downstream. Besides rivers, many lakes can also be

found in Xinjiang, such as Jili lake, Ulungur lake, Sarim lake, Kanas lake and Bosten lake. Most of them are reed lakes and there a diverse group of insects with representatives of most aquatic orders can be found.

From previous records, about 43 species of aquatic beetles across five families and 20 genera are recorded from Xinjiang. Moreover, some of these taxa have their type localities in Xinjiang. The recent faunistic works can be referred, especially respective volumes of Catalogue of Palaearctic Coleoptera (Löbl & Smetana 2003a, b). The catalogue by Anders Nilsson is freely available on line at <http://www.emg.umu.se/biginst/andersn/index.htm>.

Materials and methods

Aquatic beetles were collected by a team from Xinjiang Institute of Education during July–August 2005 and July–August 2006. Northern Xinjiang was first surveyed in July–August 2005 and then southern Xinjiang in July–August 2006. We sampled both lotic and lentic habitats with sweep net or D-frame aquatic net as a qualitative collection. In total 36 sites were chosen (Table 1 and Fig. 1). At each site, we chose a variety of aquatic habitats to sample, including rivers, streams, lakes, reservoirs, ponds, rice paddies and marshes. Additionally, many sub-habitats within a habitat were also selected for sampling. All specimens of aquatic beetles collected were fixed in the field and stored in 100% ethyl alcohol.

Results and discussion

According to the terrestrial zoogeographic regions in the world, Xinjiang belongs to Palaearctic region. The previous records of aquatic beetles for this region can be found in recent faunistic works (e.g., the Catalogue of Palaearctic Coleoptera). In total of 66 species of aquatic beetles across seven families (Dytiscidae, Gyrinidae, Haliplidae, Noteridae, Helophoridae, Hydraenidae

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and Hydrophilidae) and 32 genera are recorded from Xinjiang (in Table 2). Of the total 66 species, 16 species are newly recorded from China, 43 species are recorded from Xinjiang for the first time, and seven species (*Noterus clavicornis* (DeGeer), *Hygrotus chinensis* (Sharp), *Hygrotus flaviventris* (Motschulsky), *Hydroporus goldschmidtii* (Gschwentner), *Agabus basalis* (Gebler), *Agabus biguttatus* (Olivier) and *Hydrobius fuscipes* (Linnaeus)) are previously reported from Xinjiang but their concrete localities were not given before. Meanwhile, we marked the prior records of 16 species cited from unpublished papers except *Pelto-*

dytes caesus (Duftschmid) (Jia 2003) and *Paracymus relaxus* Rey (Jia 2005) are also given in Table 2. Most of these taxa are from Dytiscidae and Hydrophilidae. Additionally, detail information of these species is also given in Table 2.

We made an extensive survey of aquatic beetles in various aquatic habitats in Xinjiang, and firstly give a detailed report on aquatic beetles in Xinjiang. However, a considerable amount of field work is still needed for study of aquatic beetles in Xinjiang in the future.

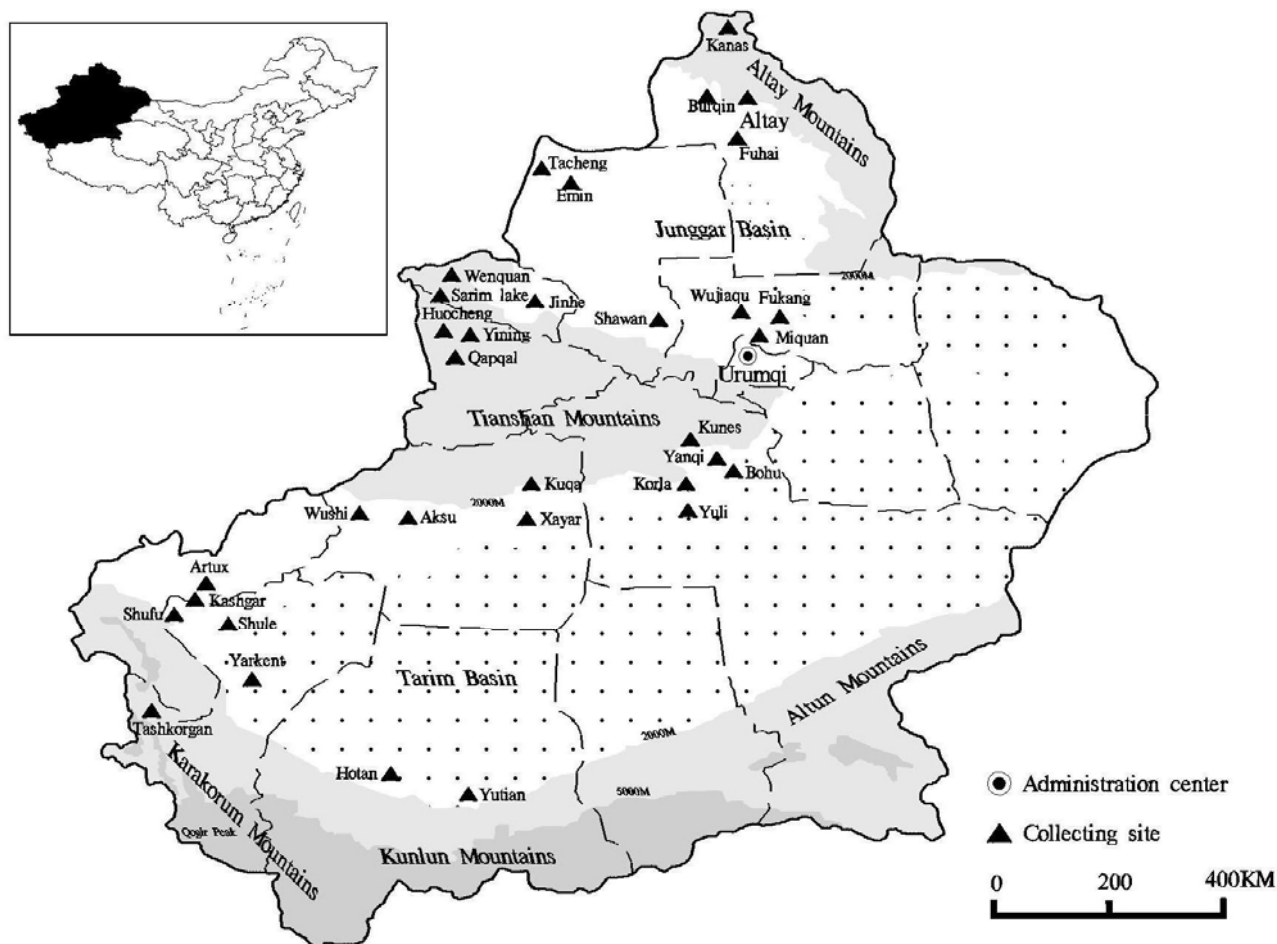


Fig. 1 Location of surveyed sites for aquatic beetles in Xinjiang Uygur Autonomous Region, China

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Table 1. Survey sites of aquatic beetles in Xinjiang Uygur Autonomous Region, China

Site	Latitude and longitude	Elevation	Time schedule	Habitats
Localities of Northern Xinjiang (July-August 2005)				
Altay	N48°26'06.04", E87°12'18.36"	2029 m	10Aug.2005	small pond; stream
Burqin	N48°22'34.76", E86°53'48.38"	1335 m	7Aug.2005	Irtys river basin ; Haba river
Emin	N46°41'37.77", E83°09'22.45"	551 m	5-6Aug.2005	ponds
Fukang	N44°09'11.22", E87°58'49.40"	597 m	20July.2005	river
Fuhai	N47°06'39.03", E87°29'26.49"	496 m	11Aug.2005	Jili lake; Ulungur lake; pool
Huocheng	N44°02'59.78", E80°52'00.68"	632 m	27July.2005	channels
Jinhe	N44°36'21.73", E82°53'24.20"	314 m	22-23July.2005	river
Kanas	N48°40'09.25", E87°02'25.25"	1618 m	8-9Aug.2005	lake;damp depressions
Kunes	N42°19'03.41", E86°23'26.29"	1108 m	31July.2005	damp depressions
Miquan	N43°57'58.91", E87°42'04.98"	649 m	18July.2005	rice paddies
Narat	N43°19'20.25", E84°00'35.32"	1380 m	30July.2005	small pool
Qapqal	N43°49'53.47", E81°10'49.81"	605 m	29July.2005	marsh
Sarim lake	N44°27'53.76", E81°08'01.27"	2370 m	26July.2005	Sarim lake
Shawan	N44°20'08.84", E85°21'39.82"	546 m	21July.2005	ponds
Tacheng	N46°44'43.67", E82°58'52.04"	546 m	1-4Aug.2005	ponds; stream
Urumqi	N43°49'25.22", E87°38'35.12"	914 m	15-17July.2005	stream; river
Wenquan	N44°58'59.65", E81°01'45.02"	1321 m	24-25July.2005	pond; brook
Wujiaqu	N44°12'02.47", E87°32'53.36"	466 m	19July.2005	pond
Yining	N43°54'36.21", E81°18'08.99"	631 m	28 July.2005	pool; Yili valley
Localities of Southern Xinjiang (July-August 2006)				
Aksu	N41°11'54.05", E80°12'30.70"	1190 m	18July.2006	rice paddies;stream
Artux	N39°42'36.75", E76°09'41.44"	1309m	24July.2006	ponds
Bohu	N41°46'34.66", E86°36'56.24"	1076 m	13July.2006	Bosten reed lake
Hotan	N37°07'00.49", E79°48'31.20"	1543 m	28July.2006	rice paddies
Kashgar	N39°26'42.66", E75°58'51.79"	1312 m	20July.2006	rice paddies;stream
Korla	N41°45'52.47", E86°07'44.31"	1250 m	15July.2006	peacock river
Kuqa	N41°43'13.70", E82°54'37.88"	1134 m	16July.2006	reservoirs; ponds
Moyu	N37°16'07.72", E79°43'40.88"	1327 m	27July.2006	rice paddies
Shufu	N39°22'43.45", E75°51'11.55"	1335 m	23July.2006	damp depressions
Shule	N39°23'57.22", E76°03'08.72"	1270 m	21-22July.2006	marsh; ground water pool
Tashkorgan	N37°45'39.01", E75°13'52.61"	3271 m	1-2Aug.2006	rain water pool
Wushi	N41°12'22.70", E79°13'33.44"	1442 m	19July.2006	damp depressions
Xayar	N41°12'53.70", E82°53'21.56"	975 m	17July.2006	ponds; polluted water channel
Yanqi	N42°03'17.18", E86°34'01.38"	1055 m	12July.2006	marsh; Kaidu river
Yarkent	N38°24'53.95", E77°15'58.50",	1227 m	25-26July.2006	river
Yuli	N41°22'44.83", E86°28'46.17"	881 m	14July.2006	ponds;
Yutian	N36°50'59.34", E81°39'25.39",	1459 m	29-31July.2006	rice paddies

Table 2. Checklist of aquatic beetles in Xinjiang Uygur Autonomous Region, China

Species	Material	Species	Material
<i>A. lutescens</i> (Stephens) *	Altay(1ex)	<i>Helochares obscurus</i> (Mller) *	Tacheng (1ex), Yining (1ex)
<i>A. basalis</i> (Gebler) ⁺	Yanqi(1ex)	<i>Helophorus frater d'Orchymont</i>	Bohu (2exs)
<i>A. biguttatus</i> (Olivier) ⁺	Yanqi(6exs)	<i>Helophorus</i> sp	Wenquan (1, female)
<i>A. conspersus</i> (Marshall)	Urumqi(1ex), Kuqa(5exs), Tashkorgan (1ex); ●Prior record at Urumqi, Qinghe, Kuqa, Tashkorgan	<i>Herophydrus musicus</i> (Klug)	Yanqi (5exs)
<i>Agabus amoenus</i> Solsky	Korla(3exs)	<i>Hydaticus grammicus</i> Germer	Shule(8exs), Fuhai (2exs)
<i>Anacaena limbata</i> (Fabricius) *	Tacheng(1ex)	<i>Hydrobius fuscipes</i> (Linnaeus) ⁺	Kanas(1ex), Yining (3exs), Bohu (5exs)
<i>Aulonogyrus concinnus</i> (Klug)	Huocheng(2exs), Burqin(3exs), Korla(6exs), Kashgar(8exs)	<i>Hydrochara affinis</i> (Sharp)	Urumqi(2, male)
<i>B. fulvus</i> Kuwert*	Qapqal(4exs)	<i>Hydroglyphus licenti</i> (Feng)	Urumqi(21exs), Yining(63exs), Qapqal (45exs), Korla(55exs); ●Prior record at Urumqi, Yining, Qapqal, Korla
<i>B. spinosus</i> (Steven)	Urumqi (23exs), Miqan (4exs), Shawan (54exs), Yining (2exs), Yanqi (6exs), Bohu (3exs), Yuli (15exs), Korla (32exs), Kuqa (4exs), Wushi (1ex), Hotan (2ex); ●Prior record at Yining, Hotan	<i>Hydrophilus piceus</i> (Linnaeus)	Tacheng(2exs), Yining(8exs); ●Prior record at Tianshan
<i>Berosus asiaticus</i> Kuwert*	Urumqi (5exs), Jinhe(2exs), Yining (8exs), Qapqal (17exs), Wushi (1ex)	<i>Hydroporus discretus</i> Fairmaire	Qapqal(3exs), Kuqa(21exs); ●Prior record at Kuqa, Qapqal
<i>Colymbetes semonovi</i> Jakovlev	Emin (3exs), Yuli (1ex), Korla (5exs), Xayar (7exs); ●Prior record at Yuli, Korla, Hotan	<i>Hygrotus chinensis</i> Sharp ⁺	Fuhai(1ex)
<i>Cybister lateralimarginalis</i> (DeGeer)	Yining(1ex); ●Prior record at Tarim	<i>Hyphydrus</i> sp.	Miqan (1, female), Fuhai(1, female)
<i>E. fuscipennis</i> (Thomson) *	Tacheng(4exs), Emin(2exs), Aksu(3exs)	<i>Ilybius sinctus</i> Sharp	Shule (2exs)
<i>E. quadripunctatus</i> (Herbst)	Emin(2exs), Burqin(3exs), Bohu(5exs)	<i>L. bipunctatus</i> (Fabricius) *	Urumqi(7exs)
<i>E. testaceus</i> Fabricius*	Tacheng(1ex), Yining(1ex), Bohu(2exs)	<i>L. cinereus</i> Motschulsky*	Urumqi(1ex)
<i>Enochrus bicolor</i> (Fabricius)	Sarim lake(1ex), Burqin (1ex), Fuhai(10exs), Yanqi (5exs), Bohu(7exs), Yuli (6exs), Kuqa (17exs), Aksu (10exs)	<i>L. decorus</i> (Gyllenhal) *	Korla(3exs)
<i>G. distinctus</i> Aub	Emin(6exs), Burqin(4exs), Altay(3exs)	<i>L. minutus</i> (Linnaeus) *	Altay(2exs)
<i>G. minutus</i> Fabricius	Bohu(6exs), Kashgar(8exs)	<i>L. pallidissimus</i> Reitter*	Yining(2exs)
<i>G. paykulli</i> Ochs	Yining(3exs), Tacheng(2exs), Korla(7exs)	<i>L. striatulus</i> (Fabricius)	Yining(1ex)
<i>Gyrinus caspius</i> Menetries	Bohu(4exs), Tarim(6exs)	<i>L. sublaevis</i> Sahlberg*	Kunes(1ex)
<i>H. goldschmidtii</i> Gschwendtner +	Yarkent(1ex)	<i>L. poecilus</i> Klug	Urumqi(6exs), Yining(10exs); ●Prior record at Urumqi, Yining
<i>H. imaeusis</i> d'Orchymont	Qapqal(1ex)	<i>L. sharpi</i> Regimbart	Miqan(3exs)
<i>H. kerimi</i> Ganglbauer*	Urumqi (4exs), Shawan (7exs), Jinhe (1ex), Qapqal (14exs)	<i>Laccobius biguttatus</i> Gerhardt	Yining (23exs), Qapqal (42exs), Fuhai (1ex), Korla (7exs), Kashgar (10exs)
<i>H. mongoliensis</i> Angus*	Fukang (7exs), Qapqal (30exs)	<i>Laccophilus minutus</i> (Linnaeus)	Wenquan(5exs), Tacheng (6exs), Yining (9exs); ●Prior record at Yining
<i>H. montanus</i> d'Orchymont	Kuqa (86exs)	<i>Nebrioporus amurensis</i> (Sharp)	Urumqi(1ex), Fukang (32exs), Yuli(1ex), Korla (41exs), Kashgar (16exs); ●Prior record at Urumqi, Fukang, Yuli, Korla
<i>H. pusillus</i> (Fabricius)	Miqan(24exs), Emin(18exs)	<i>Noterus clavicornis</i> (De Geer) ⁺	Yanqi (2exs), Kashgar(2exs)
<i>H. flavipes</i> (Steven)	Fuhai(1ex); ●Prior record at Tekes	<i>Ochthebius</i> sp.	Kunes(3exs)
<i>H. flaviventris</i> (Motschulsky) ⁺	Shawan(7exs)	<i>Orectochilus villosus</i> Mueller	Tacheng(12exs), Burqin(2exs)
<i>H. impressopunctatus</i> (Schaller)	Sarim lake(3exs), Fuhai (12exs), Bohu (9exs); ●Prior record at Urumqi	<i>P. relaxus</i> Rey	Yining(4exs); ●Prior record at Yining
<i>H. sibiricus</i> Motschulsky	Wenquan(9exs), Altay(7exs)	<i>Paracymus aeneus</i> (Germar)*	Bohu(3exs), Yuli(5exs), Kuqa(1ex)
<i>H. trilineatus</i> (Feng)	Urumqi (3exs), Shawan (19exs), Bohu (10exs); ●Prior record at Urumqi, Shawan	<i>Peltodytes caesus</i> (Duftschmid)	Tacheng(1ex); ●Prior record at Yining
<i>H. unguicularis</i> (Crotch)	Bohu(1ex)	<i>Platambus</i> sp.	Sarim lake(3, female)
<i>Haliphys diruptus</i>	Shule(6exs)	<i>Rhantus suturalis</i> McLeay	Wenquan (3exs), Yining (7exs), Tacheng (2exs), Emin (6exs), Yanqi (4exs), Bohu (6exs), Yuli (5exs); ●Prior record at Yuli, Hotan

* New records from China. ⁺ previously reported from Xinjiang but their concrete localities are not stated.